

C L A I M S

1. A moving picture encoding method

2 characterized by comprising at least the steps of:
3 obtaining a temporally hierarchized signal by
4 temporally hierarchically dividing a moving picture
5 signal;
6 obtaining a temporally hierarchized spatial
7 high-frequency signal by performing a high frequency
8 generation process on the temporally hierarchized signal
9 in spatial hierarchical division;
10 obtaining a reduced image signal by performing
11 a low frequency generation process on the moving picture
12 signal in spatial hierarchical division; and
13 obtaining a reduced temporally hierarchized
14 signal by temporally hierarchizing the reduced image
15 signal.

2. A moving picture encoding

2 method according to claim 1, characterized in that the
3 temporally hierarchized spatial high-frequency signal
4 and reduced temporally hierarchized signal are encoded.

3. A moving picture encoding method

2 characterized by comprising at least the steps of:
3 obtaining a prediction error signal by
4 performing interframe prediction on a moving picture
5 signal;
6 obtaining a prediction error spatial
7 high-frequency signal by performing a high frequency

8 generation process on the prediction error signal in
9 spatial hierarchical division;
10 obtaining a reduced image signal by performing
11 a low-frequency signal generation process on the moving
12 picture signal in spatial hierarchical division; and
13 obtaining a reduced interframe prediction
14 error signal as a prediction error signal by performing
15 interframe prediction on the reduced image signal.

4. A moving picture encoding
2 method according to claim 3, characterized in that the
3 prediction error spatial high-frequency signal and
4 reduced interframe prediction error signal are encoded.

5. A moving picture encoding method of
2 performing a three-dimensional subband dividing process
3 which performs motion compensation prediction on a
4 moving picture signal and also subband divides the
5 moving picture signal in a spatial direction,
6 characterized in that the three-dimensional subband
7 dividing process comprises at least:

8 the motion detection step of obtaining motion
9 information by detecting an interframe motion of the
10 moving picture signal;

11 the motion compensation prediction step of
12 obtaining a prediction error signal by performing motion
13 compensation prediction on the moving picture signal in
14 accordance with the motion information;

15 the prediction error signal spatial division

16 step of generating a spatial low-frequency prediction
17 error subband signal and spatial high-frequency
18 prediction error subband signal by spatially subband
19 dividing the prediction error signal; and
20 the band signal spatial division step of
21 generating a spatial low-frequency intra-subband signal
22 and spatial high-frequency intra-subband signal by
23 spatially subband dividing the moving picture signal.

6. A moving picture encoding method according
2 to claim 5, characterized in that the motion
3 compensation prediction step, prediction error signal
4 spatial division step, and band signal spatial division
5 step are performed on the moving picture signal, and the
6 motion compensation prediction step, prediction error
7 signal spatial division step, and band signal spatial
8 division step are recurrently repeated by replacing the
9 spatial low-frequency intra-subband signal obtained
10 after the band signal spatial division step with the
11 moving picture signal.

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9. A moving picture encoding method of
2 performing a three-dimensional subband dividing process
3 which subband divides a moving picture signal in both a
4 temporal direction and spatial direction, characterized
5 in that the three-dimensional subband dividing process
6 comprises at least:

7 the motion detection step of obtaining motion
8 information by detecting an interframe motion of the
9 moving picture signal;
10 the temporal subband division step of
11 obtaining a temporal low-frequency subband signal and
12 temporal high-frequency subband signal by motion
13 compensating the moving picture signal in accordance
14 with the motion information, and temporally subband
15 dividing the motion compensated moving picture signal;
16 the temporal high-frequency subband spatial
17 division step of generating a temporal
18 high-frequency/spatial low-frequency subband signal and
19 temporal high-frequency/spatial high-frequency subband
20 signal by spatially subband dividing the temporal
21 high-frequency subband signal;
22 the temporal low-frequency subband spatial
23 division step of generating a temporal
24 low-frequency/spatial low-frequency subband signal and
25 temporal low-frequency/spatial high-frequency subband
26 signal by spatially subband dividing the temporal
27 low-frequency subband signal; and
28 the band signal spatial division step of
29 generating a spatial low-frequency intra-subband signal
30 and spatial high-frequency intra-subband signal by
31 spatially subband dividing the moving picture signal.

10. A moving picture encoding method
2 according to claim 9, characterized in that the temporal

3 subband division step, temporal high-frequency subband
4 spatial division step, temporal low-frequency subband
5 spatial division step, and band signal spatial division
6 step are performed on the moving picture signal, and the
7 temporal subband division step, temporal high-frequency
8 subband spatial division step, temporal low-frequency
9 subband spatial division step, and band signal spatial
10 division step are recurrently repeated by replacing the
11 spatial low-frequency intra-subband signal obtained
12 after the band signal spatial division step with the
13 moving picture signal.

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13. A moving picture decoding method

2 characterized by comprising the steps of:

3 generating a temporal high-frequency/spatial
4 low-frequency signal by referring to a temporal
5 high-frequency signal, temporal low-frequency signal,
6 and temporal low-frequency/spatial high-frequency
7 signal;

8 generating a second temporal low-frequency
9 signal by referring to the temporal low-frequency signal
10 and temporal low-frequency/spatial high-frequency
11 signal;

12 generating a second temporal high-frequency
13 signal by using the temporal high-frequency/spatial
14 low-frequency signal and a temporal

15 high-frequency/spatial high-frequency signal; and
16 combining the second temporal low-frequency
17 signal and second temporal high-frequency signal.

14. A moving picture decoding method
2 characterized by comprising:
3 the first step of generating a spatial
4 low-frequency prediction error subband signal by
5 referring to a prediction error signal, spatial
6 low-frequency intra-subband signal, and spatial
7 high-frequency intra-subband signal;
8 the second step of obtaining a second
9 prediction error signal by spatially subband combining
10 the spatial low-frequency prediction error subband
11 signal and spatial high-frequency prediction error
12 subband signal;
13 the third step of obtaining an intra-band
14 signal by spatially subband combining the spatial
15 low-frequency intra-subband signal and spatial
16 high-frequency intra-subband signal; and
17 the fourth step of combining the intra-band
18 signal and second prediction error signal.

15. A moving picture decoding method
2 according to claim 14, characterized in that the first
3 step, the second step, and the third step are
4 recurrently repeated by replacing the second prediction
5 error signal with the prediction error signal, and the
6 intra-band signal with the spatial low-frequency

7 intra-subband signal.

16. A moving picture decoding method
2 characterized by comprising:
3 the first step of generating a spatial
4 low-frequency prediction error subband signal by
5 referring to a prediction error signal, spatial
6 low-frequency intra-subband signal, and spatial
7 high-frequency intra-subband signal;
8 the second step of obtaining a second
9 prediction error signal by spatially subband combining
10 the spatial low-frequency prediction error subband
11 signal and spatial high-frequency prediction error
12 subband signal;
13 the third step of obtaining an intra-band
14 signal by spatially subband combining the spatial
15 low-frequency intra-subband signal and spatial
16 high-frequency intra-subband signal; and
17 the fourth step of adding the second
18 prediction error signal to the intra-band signal by
19 motion compensation prediction.

17. A moving picture decoding method
2 according to claim 16, characterized in that the first
3 step, the second step, and the third step are
4 recurrently repeated by replacing the second prediction
5 error signal with the prediction error signal, and the
6 intra-band signal with the spatial low-frequency
7 intra-subband signal.

18. A moving picture decoding method

2 characterized by comprising:

3 the first step of generating a spatial

4 low-frequency prediction error subband signal by

5 referring to at least one or a combination of a spatial

6 low-frequency intra-subband signal and spatial

7 high-frequency intra-subband signal, and a prediction

8 error signal;

9 the second step of obtaining a second

10 prediction error signal by spatially subband combining

11 the spatial low-frequency prediction error subband

12 signal and spatial high-frequency prediction error

13 subband signal;

14 the third step of obtaining an intra-band

15 signal by spatially subband combining the spatial

16 low-frequency intra-subband signal and spatial

17 high-frequency intra-subband signal; and

18 the fourth step of combining the intra-band

19 signal and second prediction error signal.

19. A moving picture decoding method

2 according to claim 18, characterized in that the first

3 step, the second step, and the third step are

4 recurrently repeated by replacing the second prediction

5 error signal with the prediction error signal, and the

6 intra-band signal with the spatial low-frequency

7 intra-subband signal.

20. A moving picture decoding method

2 characterized by comprising:
3 the first step of generating a temporal
4 high-frequency/spatial low-frequency subband signal by
5 referring to a temporal high-frequency subband signal,
6 temporal low-frequency subband signal, and temporal
7 low-frequency/spatial high-frequency subband signal;
8 the second step of obtaining a second temporal
9 high-frequency subband signal by spatially subband
10 combining the temporal high-frequency/spatial
11 low-frequency subband signal and a temporal
12 high-frequency/spatial high-frequency subband signal;
13 the third step of obtaining a second temporal
14 low-frequency subband signal by spatially subband
15 combining the temporal low-frequency subband signal and
16 temporal low-frequency/spatial high-frequency subband
17 signal; and
18 the fourth step of combining the second
19 temporal low-frequency subband signal and second
20 temporal high-frequency subband signal.

21. A moving picture decoding method.
2 according to claim 20, characterized in that the first
3 step, the second step, and the third step are
4 recurrently repeated by replacing the second temporal
5 high-frequency subband signal with the temporal
6 high-frequency subband signal, and the second temporal
7 low-frequency subband signal with the temporal
8 low-frequency subband signal.

22. A moving picture decoding method

2 characterized by comprising:

3 the first step of generating a temporal
4 high-frequency/spatial low-frequency subband signal by
5 referring to at least one or a combination of a temporal
6 low-frequency subband signal and temporal
7 low-frequency/spatial high-frequency subband signal, and
8 a temporal high-frequency subband signal;

9 the second step of obtaining a second temporal
10 high-frequency subband signal by spatially subband
11 combining the temporal high-frequency/spatial
12 low-frequency subband signal and a temporal
13 high-frequency/spatial high-frequency subband signal;

14 the third step of obtaining a second temporal
15 low-frequency subband signal by spatially subband
16 combining the temporal low-frequency subband signal and
17 temporal low-frequency/spatial high-frequency subband
18 signal; and

19 the fourth step of combining the second
20 temporal low-frequency subband signal and second
21 temporal high-frequency subband signal.

23. A moving picture decoding method

2 according to claim 22, characterized in that the first
3 step, the second step, and the third step are
4 recurrently repeated by replacing the second temporal
5 high-frequency subband signal with the temporal
6 high-frequency subband signal, and the second temporal

7 low-frequency subband signal with the temporal
8 low-frequency subband signal.

24. A moving picture decoding method

2 characterized by comprising:

3 the first step of generating a temporal
4 low-frequency/spatial low-frequency subband signal by
5 referring to a spatial low-frequency intra-subband
6 signal and temporal high-frequency/spatial
7 high-frequency subband signal;

8 the second step of generating a temporal
9 high-frequency/spatial low-frequency subband signal by
10 referring to a temporal high-frequency subband signal,
11 the temporal low-frequency/spatial low-frequency subband
12 signal, and a temporal low-frequency/spatial
13 high-frequency subband signal;

14 the third step of obtaining a second temporal
15 high-frequency subband signal by spatially subband
16 combining the temporal high-frequency/spatial
17 low-frequency subband signal and temporal
18 high-frequency/spatial high-frequency subband signal;

19 the fourth step of obtaining a second temporal
20 low-frequency subband signal by spatially subband
21 combining the temporal low-frequency/spatial
22 low-frequency subband signal and temporal
23 low-frequency/spatial high-frequency subband signal; and

24 the fifth step of combining the second
25 temporal low-frequency subband signal and second

26 temporal high-frequency subband signal.

25. A moving picture decoding method

2 according to claim 24, characterized in that the first
3 step, the second step, the third step, and the fourth
4 step are recurrently repeated by replacing the second
5 temporal high-frequency subband signal with the temporal
6 high-frequency subband signal, and the second temporal
7 low-frequency subband signal with the spatial
8 low-frequency intra-subband signal.

26. A moving picture decoding method

2 characterized by comprising:

3 the first step of generating a temporal
4 low-frequency/spatial low-frequency subband signal by
5 referring to a spatial low-frequency intra-subband
6 signal and temporal high-frequency/spatial
7 high-frequency subband signal;

8 the second step of generating a temporal
9 high-frequency/spatial low-frequency subband signal by
10 referring to at least one or a combination of the
11 temporal low-frequency/spatial low-frequency subband
12 signal and a temporal low-frequency/spatial
13 high-frequency subband signal, and a temporal
14 high-frequency subband signal;

15 the third step of obtaining a second temporal
16 high-frequency subband signal by spatially subband
17 combining the temporal high-frequency/spatial
18 low-frequency subband signal and temporal

19 high-frequency/spatial high-frequency subband signal;
20 the fourth step of obtaining a second temporal
21 low-frequency subband signal by spatially subband
22 combining the temporal low-frequency/spatial
23 low-frequency subband signal and temporal
24 low-frequency/spatial high-frequency subband signal; and
25 the fifth step of combining the second
26 temporal low-frequency subband signal and second
27 temporal high-frequency subband signal.

27. A moving picture decoding method

2 according to claim 26, characterized in that the first
3 step, the second step, the third step, and the fourth
4 step are recurrently repeated by replacing the second
5 temporal high-frequency subband signal with the temporal
6 high-frequency subband signal, and the second temporal
7 low-frequency subband signal with the spatial
8 low-frequency intra-subband signal.

28. A moving picture encoding method

2 characterized by comprising the steps of:
3 obtaining a time filtering signal by filtering
4 a moving picture signal in a temporal direction;
5 obtaining a time filtering lower hierarchy
6 signal and time filtering upper hierarchy signal by
7 spatially hierarchically dividing the time filtering
8 signal;
9 obtaining an upper hierarchy moving picture
10 signal by spatially hierarchically dividing the moving

11 picture signal;
12 obtaining an upper hierarchy time filtering
13 signal by filtering the upper hierarchy moving picture
14 signal in the temporal direction; and
15 encoding the time filtering lower hierarchy
16 signal and upper hierarchy time filtering signal.

29. A moving picture encoding method
2 according to claim 28, characterized by further
3 comprising the step of replacing the time filtering
4 upper hierarchy signal with the upper hierarchy time
5 filtering signal.

30. A moving picture decoding method
2 characterized by comprising the steps of:
3 decoding a time filtering lower hierarchy
4 signal and upper hierarchy time filtering signal;
5 obtaining a time filtering upper hierarchy
6 signal by filtering the upper hierarchy time filtering
7 signal in a temporal direction;
8 obtaining a time filtering signal by spatially
9 hierarchically combining the time filtering lower
10 hierarchy signal and time filtering upper hierarchy
11 signal; and
12 obtaining a moving picture signal by filtering
13 the time filtering signal in the temporal direction.

31. A moving picture decoding method
2 according to claim 30, characterized by further
3 comprising the step of correcting, by referring to a

4 signal of a frame different from a frame of the time
5 filtering upper hierarchy signal, the time filtering
6 upper hierarchy signal to a time filtering upper
7 hierarchy signal which belongs to an upper hierarchy
8 obtained by hierarchical division after
9 temporal-direction filtering is performed at a decoding
10 resolution.

32. A moving picture encoding program
2 characterized by executing at least the steps of:
3 obtaining a temporally hierarchized signal by
4 temporally hierarchically dividing a moving picture
5 signal;
6 obtaining a temporally hierarchized spatial
7 high-frequency signal by performing a high frequency
8 generation process on the temporally hierarchized signal
9 in spatial hierarchical division;
10 obtaining a reduced image signal by performing
11 a low frequency generation process on the moving picture
12 signal in spatial hierarchical division; and
13 obtaining a reduced temporally hierarchized
14 signal by temporally hierarchizing the reduced image
15 signal.

33. A moving picture encoding
2 program according to claim 32, characterized in that the
3 temporally hierarchized spatial high-frequency signal
4 and reduced temporally hierarchized signal are encoded.

34. A moving picture encoding program

2 characterized by executing at least the steps of:
3 obtaining a prediction error signal by
4 performing interframe prediction on a moving picture
5 signal;
6 obtaining a prediction error spatial
7 high-frequency signal by performing a high frequency
8 generation process on the prediction error signal in
9 spatial hierarchical division;
10 obtaining a reduced image signal by performing
11 a low-frequency signal generation process on the moving
12 picture signal in spatial hierarchical division; and
13 obtaining a reduced interframe prediction
14 error signal as a prediction error signal by performing
15 interframe prediction on the reduced image signal.

35. A moving picture encoding
2 program according to claim 34, characterized in that the
3 prediction error spatial high-frequency signal and
4 reduced interframe prediction error signal are encoded.

36. A moving picture encoding program of
2 performing a three-dimensional subband dividing process
3 which performs motion compensation prediction on a
4 moving picture signal and also subband divides the
5 moving picture signal in a spatial direction,
6 characterized in that the three-dimensional subband
7 dividing process executes at least:
8 the motion detection step of obtaining motion
9 information by detecting an interframe motion of the

10 moving picture signal;
11 the motion compensation prediction step of
12 obtaining a prediction error signal by performing motion
13 compensation prediction on the moving picture signal in
14 accordance with the motion information;
15 the prediction error signal spatial division
16 step of generating a spatial low-frequency prediction
17 error subband signal and spatial high-frequency
18 prediction error subband signal by spatially subband
19 dividing the prediction error signal; and
20 the band signal spatial division step of
21 generating a spatial low-frequency intra-subband signal
22 and spatial high-frequency intra-subband signal by
23 spatially subband dividing the moving picture signal.

37. A moving picture encoding program
2 according to claim 36, characterized in that the motion
3 compensation prediction step, prediction error signal
4 spatial division step, and band signal spatial division
5 step are performed on the moving picture signal, and the
6 motion compensation prediction step, prediction error
7 signal spatial division step, and band signal spatial
8 division step are recurrently repeated by replacing the
9 spatial low-frequency intra-subband signal obtained
10 after the band signal spatial division step with the
11 moving picture signal.

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40. A moving picture encoding program of

2 performing a three-dimensional subband dividing process

3 which subband divides a moving picture signal in both a

4 temporal direction and spatial direction, characterized

5 in that the three-dimensional subband dividing process

6 executes at least:

7 the motion detection step of obtaining motion

8 information by detecting an interframe motion of the

9 moving picture signal;

10 the temporal subband division step of

11 obtaining a temporal low-frequency subband signal and

12 temporal high-frequency subband signal by motion

13 compensating the moving picture signal in accordance

14 with the motion information, and temporally subband

15 dividing the motion compensated moving picture signal;

16 the temporal high-frequency subband spatial

17 division step of generating a temporal

18 high-frequency/spatial low-frequency subband signal and

19 temporal high-frequency/spatial high-frequency subband

20 signal by spatially subband dividing the temporal

21 high-frequency subband signal;

22 the temporal low-frequency subband spatial

23 division step of generating a temporal

24 low-frequency/spatial low-frequency subband signal and

25 temporal low-frequency/spatial high-frequency subband

26 signal by spatially subband dividing the temporal

27 low-frequency subband signal; and

28 the band signal spatial division step of
29 generating a spatial low-frequency intra-subband signal
30 and spatial high-frequency intra-subband signal by
31 spatially subband dividing the moving picture signal.

 41. A moving picture encoding program
2 according to claim 40, characterized in that the
3 temporal subband division step, temporal high-frequency
4 subband spatial division step, temporal low-frequency
5 subband spatial division step, and band signal spatial
6 division step are performed on the moving picture
7 signal, and the temporal subband division step, temporal
8 high-frequency subband spatial division step, temporal
9 low-frequency subband spatial division step, and band
10 signal spatial division step are recurrently repeated by
11 replacing the spatial low-frequency intra-subband signal
12 obtained after the band signal spatial division step
13 with the moving picture signal.

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 44. A moving picture decoding program
2 characterized by executing at least the steps of:
3 generating a temporal high-frequency/spatial
4 low-frequency signal by referring to a temporal
5 high-frequency signal, temporal low-frequency signal,
6 and temporal low-frequency/spatial high-frequency
7 signal;
8 generating a second temporal low-frequency

9 signal by referring to the temporal low-frequency signal
10 and temporal low-frequency/spatial high-frequency
11 signal;

12 generating a second temporal high-frequency
13 signal by using the temporal high-frequency/spatial
14 low-frequency signal and a temporal
15 high-frequency/spatial high-frequency signal; and
16 combining the second temporal low-frequency
17 signal and second temporal high-frequency signal.

45. A moving picture decoding program

2 characterized by executing at least:

3 the first step of generating a spatial
4 low-frequency prediction error subband signal by
5 referring to a prediction error signal, spatial
6 low-frequency intra-subband signal, and spatial
7 high-frequency intra-subband signal;

8 the second step of obtaining a second
9 prediction error signal by spatially subband combining
10 the spatial low-frequency prediction error subband
11 signal and spatial high-frequency prediction error
12 subband signal;

13 the third step of obtaining an intra-band
14 signal by spatially subband combining the spatial
15 low-frequency intra-subband signal and spatial
16 high-frequency intra-subband signal; and

17 the fourth step of combining the intra-band
18 signal and second prediction error signal.

46. A moving picture decoding program
2 according to claim 45, characterized in that the first
3 step, the second step, and the third step are
4 recurrently repeated by replacing the second prediction
5 error signal with the prediction error signal, and the
6 intra-band signal with the spatial low-frequency
7 intra-subband signal.

47. A moving picture decoding program
2 characterized by executing at least:
3 the first step of generating a spatial
4 low-frequency prediction error subband signal by
5 referring to a prediction error signal, spatial
6 low-frequency intra-subband signal, and spatial
7 high-frequency intra-subband signal;
8 the second step of obtaining a second
9 prediction error signal by spatially subband combining
10 the spatial low-frequency prediction error subband
11 signal and spatial high-frequency prediction error
12 subband signal;
13 the third step of obtaining an intra-band
14 signal by spatially subband combining the spatial
15 low-frequency intra-subband signal and spatial
16 high-frequency intra-subband signal; and
17 the fourth step of adding the second
18 prediction error signal to the intra-band signal by
19 motion compensation prediction.

48. A moving picture decoding program

2 according to claim 47, characterized in that the first
3 step, the second step, and the third step are
4 recurrently repeated by replacing the second prediction
5 error signal with the prediction error signal, and the
6 intra-band signal with the spatial low-frequency
7 intra-subband signal.

49. A moving picture decoding program
2 characterized by executing at least:
3 the first step of generating a spatial
4 low-frequency prediction error subband signal by
5 referring to at least one or a combination of a spatial
6 low-frequency intra-subband signal and spatial
7 high-frequency intra-subband signal, and a prediction
8 error signal;
9 the second step of obtaining a second
10 prediction error signal by spatially subband combining
11 the spatial low-frequency prediction error subband
12 signal and spatial high-frequency prediction error
13 subband signal;
14 the third step of obtaining an intra-band
15 signal by spatially subband combining the spatial
16 low-frequency intra-subband signal and spatial
17 high-frequency intra-subband signal; and
18 the fourth step of combining the intra-band
19 signal and second prediction error signal.

50. A moving picture decoding program
2 according to claim 49, characterized in that the first

3 step, the second step, and the third step are
4 recurrently repeated by replacing the second prediction
5 error signal with the prediction error signal, and the
6 intra-band signal with the spatial low-frequency
7 intra-subband signal.

51. A moving picture decoding program
2 characterized by executing at least:
3 the first step of generating a temporal
4 high-frequency/spatial low-frequency subband signal by
5 referring to a temporal high-frequency subband signal,
6 temporal low-frequency subband signal, and temporal
7 low-frequency/spatial high-frequency subband signal;
8 the second step of obtaining a second temporal
9 high-frequency subband signal by spatially subband
10 combining the temporal high-frequency/spatial
11 low-frequency subband signal and a temporal
12 high-frequency/spatial high-frequency subband signal;
13 the third step of obtaining a second temporal
14 low-frequency subband signal by spatially subband
15 combining the temporal low-frequency subband signal and
16 temporal low-frequency/spatial high-frequency subband
17 signal; and
18 the fourth step of combining the second
19 temporal low-frequency subband signal and second
20 temporal high-frequency subband signal.

52. A moving picture decoding program
2 according to claim 51, characterized in that the first

3 step, the second step, and the third step are
4 recurrently repeated by replacing the second temporal
5 high-frequency subband signal with the temporal
6 high-frequency subband signal, and the second temporal
7 low-frequency subband signal with the temporal
8 low-frequency subband signal.

53. A moving picture decoding program
2 characterized by executing at least:
3 the first step of generating a temporal
4 high-frequency/spatial low-frequency subband signal by
5 referring to at least one or a combination of a temporal
6 low-frequency subband signal and temporal
7 low-frequency/spatial high-frequency subband signal, and
8 a temporal high-frequency subband signal;
9 the second step of obtaining a second temporal
10 high-frequency subband signal by spatially subband
11 combining the temporal high-frequency/spatial
12 low-frequency subband signal and a temporal
13 high-frequency/spatial high-frequency subband signal;
14 the third step of obtaining a second temporal
15 low-frequency subband signal by spatially subband
16 combining the temporal low-frequency subband signal and
17 temporal low-frequency/spatial high-frequency subband
18 signal; and
19 the fourth step of combining the second
20 temporal low-frequency subband signal and second
21 temporal high-frequency subband signal.

54. A moving picture decoding program
2 according to claim 53, characterized in that the first
3 step, the second step, and the third step are
4 recurrently repeated by replacing the second temporal
5 high-frequency subband signal with the temporal
6 high-frequency subband signal, and the second temporal
7 low-frequency subband signal with the temporal
8 low-frequency subband signal.

55. A moving picture decoding program
2 characterized by executing at least:
3 the first step of generating a temporal
4 low-frequency/spatial low-frequency subband signal by
5 referring to a spatial low-frequency intra-subband
6 signal and temporal high-frequency/spatial
7 high-frequency subband signal;
8 the second step of generating a temporal
9 high-frequency/spatial low-frequency subband signal by
10 referring to a temporal high-frequency subband signal,
11 the temporal low-frequency/spatial low-frequency subband
12 signal, and a temporal low-frequency/spatial
13 high-frequency subband signal;
14 the third step of obtaining a second temporal
15 high-frequency subband signal by spatially subband
16 combining the temporal high-frequency/spatial
17 low-frequency subband signal and temporal
18 high-frequency/spatial high-frequency subband signal;
19 the fourth step of obtaining a second temporal

20 low-frequency subband signal by spatially subband
21 combining the temporal low-frequency/spatial
22 low-frequency subband signal and temporal
23 low-frequency/spatial high-frequency subband signal; and
24 the fifth step of combining the second
25 temporal low-frequency subband signal and second
26 temporal high-frequency subband signal.

56. A moving picture decoding program
2 according to claim 55, characterized in that the first
3 step, the second step, the third step, and the fourth
4 step are recurrently repeated by replacing the second
5 temporal high-frequency subband signal with the temporal
6 high-frequency subband signal, and the second temporal
7 low-frequency subband signal with the spatial
8 low-frequency intra-subband signal.

57. A moving picture decoding program
2 characterized by executing at least:
3 the first step of generating a temporal
4 low-frequency/spatial low-frequency subband signal by
5 referring to a spatial low-frequency intra-subband
6 signal and temporal high-frequency/spatial
7 high-frequency subband signal;
8 the second step of generating a temporal
9 high-frequency/spatial low-frequency subband signal by
10 referring to at least one or a combination of the
11 temporal low-frequency/spatial low-frequency subband
12 signal and a temporal low-frequency/spatial

13 high-frequency subband signal, and a temporal
14 high-frequency subband signal;
15 the third step of obtaining a second temporal
16 high-frequency subband signal by spatially subband
17 combining the temporal high-frequency/spatial
18 low-frequency subband signal and temporal
19 high-frequency/spatial high-frequency subband signal;
20 the fourth step of obtaining a second temporal
21 low-frequency subband signal by spatially subband
22 combining the temporal low-frequency/spatial
23 low-frequency subband signal and temporal
24 low-frequency/spatial high-frequency subband signal; and
25 the fifth step of combining the second
26 temporal low-frequency subband signal and second
27 temporal high-frequency subband signal.

58. A moving picture decoding program
2 according to claim 57, characterized in that the first
3 step, the second step, the third step, and the fourth
4 step are recurrently repeated by replacing the second
5 temporal high-frequency subband signal with the temporal
6 high-frequency subband signal, and the second temporal
7 low-frequency subband signal with the spatial
8 low-frequency intra-subband signal.

59. A moving picture encoding program
2 characterized by comprising the steps of:
3 obtaining a time filtering signal by filtering
4 a moving picture signal in a temporal direction;

5 obtaining a time filtering lower hierarchy
6 signal and time filtering upper hierarchy signal by
7 spatially hierarchically dividing the time filtering
8 signal;
9 obtaining an upper hierarchy moving picture
10 signal by spatially hierarchically dividing the moving
11 picture signal;
12 obtaining an upper hierarchy time filtering
13 signal by filtering the upper hierarchy moving picture
14 signal in the temporal direction; and
15 encoding the time filtering lower hierarchy
16 signal and upper hierarchy time filtering signal.

60. (amended) A moving picture encoding
2 program according to claim 59, characterized by further
3 comprising the step of replacing the time filtering
4 upper hierarchy signal with the upper hierarchy time
5 filtering signal.

61. (amended) A moving picture decoding
2 program characterized by executing at least the steps
3 of:
4 decoding a time filtering lower hierarchy
5 signal and upper hierarchy time filtering signal;
6 obtaining a time filtering upper hierarchy
7 signal by filtering the upper hierarchy time filtering
8 signal in a temporal direction;
9 obtaining a time filtering signal by spatially
10 hierarchically combining the time filtering lower

11 hierarchy signal and time filtering upper hierarchy
12 signal; and
13 obtaining a moving picture signal by filtering
14 the time filtering signal in the temporal direction.

62. (amended) A moving picture decoding
2 program according to claim 61, characterized by further
3 executing the step of correcting, by referring to a
4 signal of a frame different from a frame of the time
5 filtering upper hierarchy signal, the time filtering
6 upper hierarchy signal to a time filtering upper
7 hierarchy signal which belongs to an upper hierarchy
8 obtained by hierarchical division after
9 temporal-direction filtering is performed at a decoding
10 resolution.

63. A moving picture encoding device
2 characterized by comprising at least:
3 means for obtaining a temporally hierarchized
4 signal by temporally hierarchically dividing a moving
5 picture signal;
6 means for obtaining a temporally hierarchized
7 spatial high-frequency signal by performing a high
8 frequency generation process on the temporally
9 hierarchized signal in spatial hierarchical division;
10 means for obtaining a reduced image signal by
11 performing a low frequency generation process on the
12 moving picture signal in spatial hierarchical division;
13 and

14 means for obtaining a reduced temporally
15 hierarchized signal by temporally hierarchizing the
16 reduced image signal.

64. A moving picture encoding
2 device according to claim 63, characterized in that the
3 temporally hierarchized spatial high-frequency signal
4 and reduced temporally hierarchized signal are encoded.

65. A moving picture encoding device
2 characterized by comprising at least:
3 means for obtaining a prediction error signal
4 by performing interframe prediction on a moving picture
5 signal;
6 means for obtaining a prediction error spatial
7 high-frequency signal by performing a high frequency
8 generation process on the prediction error signal in
9 spatial hierarchical division;
10 means for obtaining a reduced image signal by
11 performing a low-frequency signal generation process on
12 the moving picture signal in spatial hierarchical
13 division; and
14 means for obtaining a reduced interframe
15 prediction error signal as a prediction error signal by
16 performing interframe prediction on the reduced image
17 signal.

66. A moving picture encoding
2 device according to claim 65, characterized in that the
3 prediction error spatial high-frequency signal and

4 reduced interframe prediction error signal are encoded.

67. A moving picture encoding device for
2 performing a three-dimensional subband dividing process
3 which performs motion compensation prediction on a
4 moving picture signal and also subband divides the
5 moving picture signal in a spatial direction,
6 characterized in that the three-dimensional subband
7 dividing process comprises at least:

8 motion detecting means for obtaining motion
9 information by detecting an interframe motion of the
10 moving picture signal;

11 motion compensation predicting means for
12 obtaining a prediction error signal by performing motion
13 compensation prediction on the moving picture signal in
14 accordance with the motion information;

15 prediction error signal spatial dividing means
16 for generating a spatial low-frequency prediction error
17 subband signal and spatial high-frequency prediction
18 error subband signal by spatially subband dividing the
19 prediction error signal; and

20 band signal spatial dividing means for
21 generating a spatial low-frequency intra-subband signal
22 and spatial high-frequency intra-subband signal by
23 spatially subband dividing the moving picture signal.

68. A moving picture encoding device
2 according to claim 67, characterized in that said motion
3 compensation predicting means, prediction error signal

4 spatial dividing means, and band signal spatial dividing
5 means are performed on the moving picture signal, and
6 the processes of said motion compensation predicting
7 means, prediction error signal spatial dividing means,
8 and band signal spatial dividing means are recurrently
9 repeated by replacing the spatial low-frequency
10 intra-subband signal obtained after said band signal
11 spatial dividing means with the moving picture signal.

69. (deleted)

70. (deleted)

71. A moving picture encoding device for
2 performing a three-dimensional subband dividing process
3 which subband divides a moving picture signal in both a
4 temporal direction and spatial direction, characterized
5 in that the three-dimensional subband dividing process
6 comprises at least:
7 motion detecting means for obtaining motion
8 information by detecting an interframe motion of the
9 moving picture signal;
10 temporal subband dividing means for obtaining
11 a temporal low-frequency subband signal and temporal
12 high-frequency subband signal by motion compensating the
13 moving picture signal in accordance with the motion
14 information, and temporally subband dividing the motion
15 compensated moving picture signal;
16 temporal high-frequency subband spatial
17 dividing means for generating a temporal

18 high-frequency/spatial low-frequency subband signal and
19 temporal high-frequency/spatial high-frequency subband
20 signal by spatially subband dividing the temporal
21 high-frequency subband signal;
22 temporal low-frequency subband spatial
23 dividing means for generating a temporal
24 low-frequency/spatial low-frequency subband signal and
25 temporal low-frequency/spatial high-frequency subband
26 signal by spatially subband dividing the temporal
27 low-frequency subband signal; and
28 band signal spatial dividing means for
29 generating a spatial low-frequency intra-subband signal
30 and spatial high-frequency intra-subband signal by
31 spatially subband dividing the moving picture signal.

72. A moving picture encoding device
2 according to claim 71, characterized in that said
3 temporal subband dividing means, temporal high-frequency
4 subband spatial dividing means, temporal low-frequency
5 subband spatial dividing means, and band signal spatial
6 dividing means are performed on the moving picture signal,
7 and the processes of said temporal subband dividing
8 means, temporal high-frequency subband spatial dividing
9 means, temporal low-frequency subband spatial dividing
10 means, and band signal spatial dividing means are
11 recurrently repeated by replacing the spatial
12 low-frequency intra-subband signal obtained after said
13 band signal spatial dividing means with the moving

14 picture signal.

73. (deleted)

74. (deleted)

75. A moving picture encoding device

2 characterized by comprising at least:

3 means for generating a temporal

4 high-frequency/spatial low-frequency signal by referring

5 to a temporal high-frequency signal, temporal

6 low-frequency signal, and temporal low-frequency/spatial

7 high-frequency signal;

8 means for generating a second temporal

9 low-frequency signal by referring to the temporal

10 low-frequency signal and temporal low-frequency/spatial

11 high-frequency signal;

12 means for generating a second temporal

13 high-frequency signal by using the temporal

14 high-frequency/spatial low-frequency signal and a

15 temporal high-frequency/spatial high-frequency signal;

16 and

17 means for combining the second temporal

18 low-frequency signal and second temporal high-frequency

19 signal.

76. A moving picture decoding device

2 characterized by comprising at least:

3 first means for generating a spatial

4 low-frequency prediction error subband signal by

5 referring to a prediction error signal, spatial

6 low-frequency intra-subband signal, and spatial
7 high-frequency intra-subband signal;
8 second means for obtaining a second prediction
9 error signal by spatially subband combining the spatial
10 low-frequency prediction error subband signal and
11 spatial high-frequency prediction error subband signal;
12 third means for obtaining an intra-band signal
13 by spatially subband combining the spatial low-frequency
14 intra-subband signal and spatial high-frequency
15 intra-subband signal; and
16 fourth means for combining the intra-band
17 signal and second prediction error signal.

77. A moving picture decoding device
2 according to claim 76, characterized in that the
3 processes of said first means, said second means, and
4 said third means are recurrently repeated by replacing
5 the second prediction error signal with the prediction
6 error signal, and the intra-band signal with the spatial
7 low-frequency intra-subband signal.

78. A moving picture decoding device
2 characterized by comprising at least:
3 first means for generating a spatial
4 low-frequency prediction error subband signal by
5 referring to a prediction error signal, spatial
6 low-frequency intra-subband signal, and spatial
7 high-frequency intra-subband signal;
8 second means for obtaining a second prediction

9 error signal by spatially subband combining the spatial
10 low-frequency prediction error subband signal and
11 spatial high-frequency prediction error subband signal;
12 third means for obtaining an intra-band signal
13 by spatially subband combining the spatial low-frequency
14 intra-subband signal and spatial high-frequency
15 intra-subband signal; and
16 fourth means for adding the second prediction
17 error signal to the intra-band signal by motion
18 compensation prediction.

79. A moving picture decoding device
2 according to claim 78, characterized in that the
3 processes of said first means, said second means, and
4 said third means are recurrently repeated by replacing
5 the second prediction error signal with the prediction
6 error signal, and the intra-band signal with the spatial
7 low-frequency intra-subband signal.

80. A moving picture decoding device
2 characterized by comprising at least:
3 first means for generating a spatial
4 low-frequency prediction error subband signal by
5 referring to at least one or a combination of a spatial
6 low-frequency intra-subband signal and spatial
7 high-frequency intra-subband signal, and a prediction
8 error signal;
9 second means for obtaining a second prediction
10 error signal by spatially subband combining the spatial

11 low-frequency prediction error subband signal and
12 spatial high-frequency prediction error subband signal;
13 third means for obtaining an intra-band signal
14 by spatially subband combining the spatial low-frequency
15 intra-subband signal and spatial high-frequency
16 intra-subband signal; and
17 fourth means for combining the intra-band
18 signal and second prediction error signal.

81. A moving picture decoding device
2 according to claim 80, characterized in that the
3 processes of said first means, said second means, and
4 said third means are recurrently repeated by replacing
5 the second prediction error signal with the prediction
6 error signal, and the intra-band signal with the spatial
7 low-frequency intra-subband signal.

82. A moving picture decoding device
2 characterized by comprising at least:
3 first means for generating a temporal
4 high-frequency/spatial low-frequency subband signal by
5 referring to a temporal high-frequency subband signal,
6 temporal low-frequency subband signal, and temporal
7 low-frequency/spatial high-frequency subband signal;
8 second means for obtaining a second temporal
9 high-frequency subband signal by spatially subband
10 combining the temporal high-frequency/spatial
11 low-frequency subband signal and a temporal
12 high-frequency/spatial high-frequency subband signal;

13 third means for obtaining a second temporal
14 low-frequency subband signal by spatially subband
15 combining the temporal low-frequency subband signal and
16 temporal low-frequency/spatial high-frequency subband
17 signal; and
18 fourth means for combining the second temporal
19 low-frequency subband signal and second temporal
20 high-frequency subband signal.

83. A moving picture decoding device
2 according to claim 82, characterized in that the
3 processes of said first means, said second means, and
4 said third means are recurrently repeated by replacing
5 the second temporal high-frequency subband signal with
6 the temporal high-frequency subband signal, and the
7 second temporal low-frequency subband signal with the
8 temporal low-frequency subband signal.

84. A moving picture decoding device
2 characterized by comprising at least:
3 first means for generating a temporal
4 high-frequency/spatial low-frequency subband signal by
5 referring to at least one or a combination of a temporal
6 low-frequency subband signal and temporal
7 low-frequency/spatial high-frequency subband signal, and
8 a temporal high-frequency subband signal;
9 second means for obtaining a second temporal
10 high-frequency subband signal by spatially subband
11 combining the temporal high-frequency/spatial

12 low-frequency subband signal and a temporal
13 high-frequency/spatial high-frequency subband signal;
14 third means for obtaining a second temporal
15 low-frequency subband signal by spatially subband
16 combining the temporal low-frequency subband signal and
17 temporal low-frequency/spatial high-frequency subband
18 signal; and
19 fourth means for combining the second temporal
20 low-frequency subband signal and second temporal
21 high-frequency subband signal.

85. A moving picture decoding device
2 according to claim 84, characterized in that the
3 processes of said first means, said second means, and
4 said third means are recurrently repeated by replacing
5 the second temporal high-frequency subband signal with
6 the temporal high-frequency subband signal, and the
7 second temporal low-frequency subband signal with the
8 temporal low-frequency subband signal.

86. A moving picture decoding device
2 characterized by comprising at least:
3 first means for generating a temporal
4 low-frequency/spatial low-frequency subband signal by
5 referring to a spatial low-frequency intra-subband
6 signal and temporal high-frequency/spatial
7 high-frequency subband signal;
8 second means for generating a temporal
9 high-frequency/spatial low-frequency subband signal by

10 referring to a temporal high-frequency subband signal,
11 the temporal low-frequency/spatial low-frequency subband
12 signal, and a temporal low-frequency/spatial
13 high-frequency subband signal;
14 third means for obtaining a second temporal
15 high-frequency subband signal by spatially subband
16 combining the temporal high-frequency/spatial
17 low-frequency subband signal and temporal
18 high-frequency/spatial high-frequency subband signal;
19 fourth means for obtaining a second temporal
20 low-frequency subband signal by spatially subband
21 combining the temporal low-frequency/spatial
22 low-frequency subband signal and temporal
23 low-frequency/spatial high-frequency subband signal; and
24 fifth means for combining the second temporal
25 low-frequency subband signal and second temporal
26 high-frequency subband signal.

87. A moving picture decoding device
2 according to claim 86, characterized in that the
3 processes of said first means, said second means, said
4 third means, and said fourth means are recurrently
5 repeated by replacing the second temporal high-frequency
6 subband signal with the temporal high-frequency subband
7 signal, and the second temporal low-frequency subband
8 signal with the spatial low-frequency intra-subband
9 signal.

88. A moving picture decoding device

2 characterized by comprising at least:
3 first means for generating a temporal
4 low-frequency/spatial low-frequency subband signal by
5 referring to a spatial low-frequency intra-subband
6 signal and temporal high-frequency/spatial
7 high-frequency subband signal;
8 second means for generating a temporal
9 high-frequency/spatial low-frequency subband signal by
10 referring to at least one or a combination of the
11 temporal low-frequency/spatial low-frequency subband
12 signal and a temporal low-frequency/spatial
13 high-frequency subband signal, and a temporal
14 high-frequency subband signal;
15 third means for obtaining a second temporal
16 high-frequency subband signal by spatially subband
17 combining the temporal high-frequency/spatial
18 low-frequency subband signal and temporal
19 high-frequency/spatial high-frequency subband signal;
20 fourth means for obtaining a second temporal
21 low-frequency subband signal by spatially subband
22 combining the temporal low-frequency/spatial
23 low-frequency subband signal and temporal
24 low-frequency/spatial high-frequency subband signal; and
25 fifth means for combining the second temporal
26 low-frequency subband signal and second temporal
27 high-frequency subband signal.

89. A moving picture decoding device

2 according to claim 88, characterized in that the
3 processes of said first means, said second means, said
4 third means, and said fourth means are recurrently
5 repeated by replacing the second temporal high-frequency
6 subband signal with the temporal high-frequency subband
7 signal, and the second temporal low-frequency subband
8 signal with the spatial low-frequency intra-subband
9 signal.

90. A moving picture encoding device

2 characterized by comprising at least:

3 means for obtaining a time filtering signal by
4 filtering a moving picture signal in a temporal
5 direction;

6 means for obtaining a time filtering lower
7 hierarchy signal and time filtering upper hierarchy
8 signal by spatially hierarchically dividing the time
9 filtering signal;

10 means for obtaining an upper hierarchy moving
11 picture signal by spatially hierarchically dividing the
12 moving picture signal;

13 means for obtaining an upper hierarchy time
14 filtering signal by filtering the upper hierarchy moving
15 picture signal in the temporal direction; and

16 means for encoding the time filtering lower
17 hierarchy signal and upper hierarchy time filtering
18 signal.

91. A moving picture encoding device

2 according to claim 90, characterized by further
3 comprising means for replacing the time filtering upper
4 hierarchy signal with the upper hierarchy time filtering
5 signal.

92. A moving picture decoding device

2 characterized by comprising at least:

3 means for decoding a time filtering lower
4 hierarchy signal and upper hierarchy time filtering
5 signal;

6 means for obtaining a time filtering upper
7 hierarchy signal by filtering the upper hierarchy time
8 filtering signal in a temporal direction;

9 means for obtaining a time filtering signal by
10 spatially hierarchically combining the time filtering
11 lower hierarchy signal and time filtering upper
12 hierarchy signal; and

13 means for obtaining a moving picture signal by
14 filtering the time filtering signal in the temporal
15 direction.

93. A moving picture decoding device

2 according to claim 92, characterized by further
3 comprising means for correcting, by referring to a
4 signal of a frame different from a frame of the time
5 filtering upper hierarchy signal, the time filtering
6 upper hierarchy signal to a time filtering upper
7 hierarchy signal which belongs to an upper hierarchy
8 obtained by hierarchical division after

9 temporal-direction filtering is performed at a decoding
10 resolution.